WHAT IS CLAIMED IS:

1. A photoelectric conversion device comprising:

a substrate serving as a lower electrode;

first conductivity-type crystalline semiconductor particles deposited on the substrate;

second conductivity-type semiconductor layers formed on the crystalline semiconductor particles;

an insulator layer formed among the crystalline semiconductor particles; and

an upper electrode layer formed on the second conductivity-type semiconductor layers,

wherein the second conductivity-type semiconductor layers each have a smaller thickness at or below an equator of each of the crystalline semiconductor particles than at a zenith thereof.

2. The photoelectric conversion device according to claim 1, wherein the thickness of each of the second conductivity-type semiconductor layers on the crystalline semiconductor particles at or below the equator is 70% or less of that at the zenith thereof.

3. The photoelectric conversion device according to claim 1, wherein the thickness of each of the second conductivity-type semiconductor layers on the crystalline semiconductor

particles at or below the equator is 40% or less of that at the zenith thereof.

4. The photoelectric conversion device according to claim 1, wherein the crystalline semiconductor particles each have an indentation toward the interior thereof at a surface below the equator.

5. The photoelectric conversion device according to claim 1, wherein the crystalline semiconductor particles have rough surfaces.

6. A photoelectric conversion device comprising:

a substrate serving as a lower electrode;

first conductivity-type crystalline semiconductor particles deposited on the substrate;

second conductivity-type semiconductor layers formed on the crystalline semiconductor particles;

an insulator layer formed among the crystalline semiconductor particles; and

an upper electrode layer formed on the second conductivity-type semiconductor layers,

wherein the second conductivity-type semiconductor layers include an impurity element with a concentration decreasing with proximity to the crystalline semiconductor particles.

7. The photoelectric conversion device according to claim 6, wherein the second conductivity-type semiconductor layers each have a thickness of not less than 5 nm and not more than 100 nm.

8. The photoelectric conversion device according to claim 6, wherein a region of each of the second conductivity-type semiconductor layers where the concentration of the impurity element is lowest comprises an intrinsic semiconductor.

9. The photoelectric conversion device according to claim 6, wherein an oxide layer or a nitride layer is formed between each of the crystalline semiconductor particles and the second conductivity-type semiconductor layers.

10. The photoelectric conversion device according to claim 6, wherein the substrate comprises aluminum or an aluminum alloy.

11. A method of manufacturing a photoelectric conversion device comprising the steps of:

depositing first conductivity-type crystalline semiconductor particles on a substrate serving as a lower electrode;

forming second conductivity-type semiconductor layers on the crystalline semiconductor particles so that at least one element selected from the group consisting of p-type or n-type impurities, oxygen, nitrogen, carbon and hydrogen is included in the semiconductor layers with a concentration gradient increasing with thickness;

forming an insulator layer among the crystalline semiconductor particles; and

forming an upper electrode layer on the second conductivity-type semiconductor layers.

12. The method of manufacturing a photoelectric conversion device according to claim 11, further comprising, prior to forming the insulator layer among the crystalline semiconductor particles, the step of removing a part of the second conductivity-type semiconductor layers that adheres to the substrate after the formation of the second conductivity-type semiconductor layers.

13. The method of manufacturing a photoelectric conversion device according to claim 12, wherein the substrate comprises aluminum or an aluminum alloy, and the step of removing a part of the second conductivity-type semiconductor layers adhering to the substrate is implemented by etching with use of hydrofluoric acid, nitric acid, hydrochloric acid,

sulfuric acid or phosphoric acid.

14. The photoelectric conversion device according to claim 6, wherein the second conductivity-type semiconductor layers on the semiconductor particles each have a smaller thickness at or below an equator of each of the semiconductor particles than at a zenith region thereof.

15. The photoelectric conversion device according to claim 14, wherein the thickness of each of the second conductivity-type semiconductor layers on the crystalline semiconductor particles at or below the equator is 70% or less of that at the zenith.

16. The photoelectric conversion device according to claim 14, wherein the thickness of each of the second conductivity-type semiconductor layers on the crystalline semiconductor particles at or below the equator is 40% or less of that at the zenith region.

17. The photoelectric conversion device according to claim 14, wherein the crystalline semiconductor particles each have an indentation toward the interior thereof at a surface below the equator.

18. The photoelectric conversion device according to claim 14, wherein the crystalline semiconductor particles have rough surfaces.